Spacecraft Spin Axis Attitude Determination

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Summary

A mathematical formulation of the spacecraft spin axis attitude determination problem in the form of a norm constrained-least-squares minimization problem is provided. The formulation has a mathematically transparent interpretation as a search for the optimal unit vector on the surface of the unit sphere. Two algorithms are developed and compared by simulation. The results show a tradeoff between estimation accuracy and computational requirements. One algorithm is about three times more accurate than the other and is therefore recommended even though it requires about 20% more in computer storage and operations, and about 50% more in central processing unit time